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Reduced Rates of Corn Rootworm Insecticides

Abstract

Full-labeled rates of commercially available corn rootworm insecticides are evaluated yearly for their ability to protect corn root systems from corn rootworm feeding injury. Less-than-labeled, or reduced, rates also have been tested in past years. Performance of both rate types are compared in this report.

Keywords

Entomology

Disciplines

Agricultural Science | Agriculture | Entomology

Reduced Rates of Corn Rootworm Insecticides

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Introduction

Full-labeled rates of commercially available corn rootworm insecticides are evaluated yearly for their ability to protect corn root systems from corn rootworm feeding injury. Less-than-labeled, or reduced, rates also have been tested in past years. Performance of both rate types are compared in this report.

Materials and Methods

Corn was planted in areas that had been planted the previous year with corn rootworm beetle "catch crops" (high populations of late-planted corn). The experimental design for all tests was a randomized complete block, with treatments applied to single 50-foot rows and replicated four times. Granular insecticide formulations were applied with modified application equipment mounted on a four-row John Deere 7100 planter (30-inch row spacing). Counter[®], Force Lorsban[®] and Thimet[®] were applied at full and three-quarter rates. Aztec[®] was applied at full and half rates. During the first two weeks of June, liquid Furadan[®] 4F post-emergence insecticide treatments were applied with a small-plot bicycle sprayer. The full rate was applied as a broadcasted treatment over the row. A one-quarter rate was applied as a seven-inch band at the base of the plant, a nozzle positioned on each side of the row to achieve this basal treatment. The same amount of active ingredient/unit area of soil was applied with each treatment. Thirteen gallons/acre of finished spray was applied in each treatment. Treatments were incorporated by cultivation in all but the 1998 and 2000 tests (no incorporation).

After the majority of corn rootworm feeding was completed (mid-July), corn root systems were dug, washed, and rated for damage on the following Iowa State Node-Injury Scale: 1.00 = one node (circle or roots), or the equivalent of an entire node eaten back to within approximately two inches of the stalk; 2.00 = two nodes eaten; and 3.00 = three nodes eaten. Damage in-between complete nodes eaten was noted as the percentage of the node missing (e.g., 0.25 = $\frac{1}{4}$ of one node eaten, 0.50 = $\frac{1}{2}$ of one node eaten, 1.25 = $1\frac{1}{4}$ of two nodes eaten).

Results and Discussion

Results in Figure 1 reflect side-by-side comparisons during two years made at five locations throughout Iowa. Historically, corn lodging (a result of corn rootworm feeding), has been kept to a minimum if no more than **one node** of roots has been eaten (1.00 node-injury rating). If there is adequate moisture, yield potentials normally have been reached if no more than **a half node** of roots has been eaten (0.50 node-injury rating). In this summary there were no significant differences between the full and half rates of the same insecticide. Aztec[®] performed very well at the half rate when placed either T-band (T) or furrow (F).

Figure 2 represents eight different locations over five years. In all but one instance, the one-quarter rate of Furadan[®] liquid kept feeding below one node. However, potential yield loss was prevented only 37% of the time with the reduced rate, as opposed to 75% of the time with the full rate.

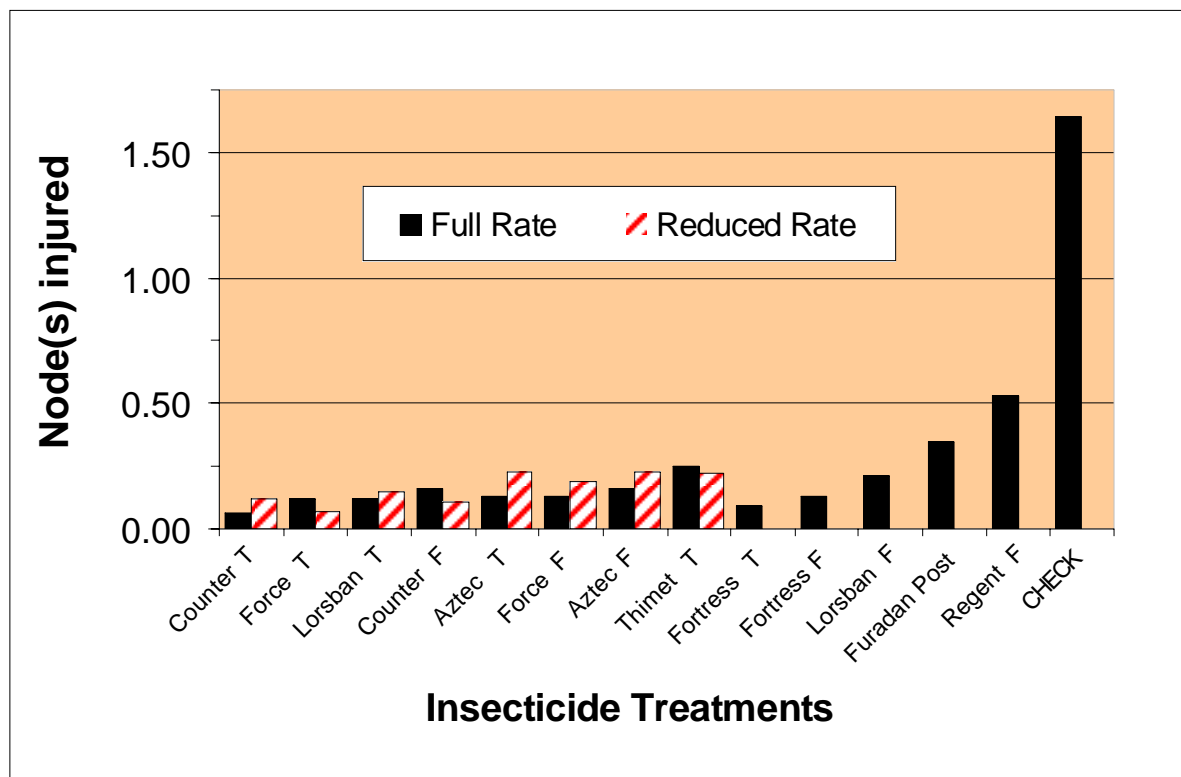


Figure 1. 1998 & 2000 reduced rate summary.

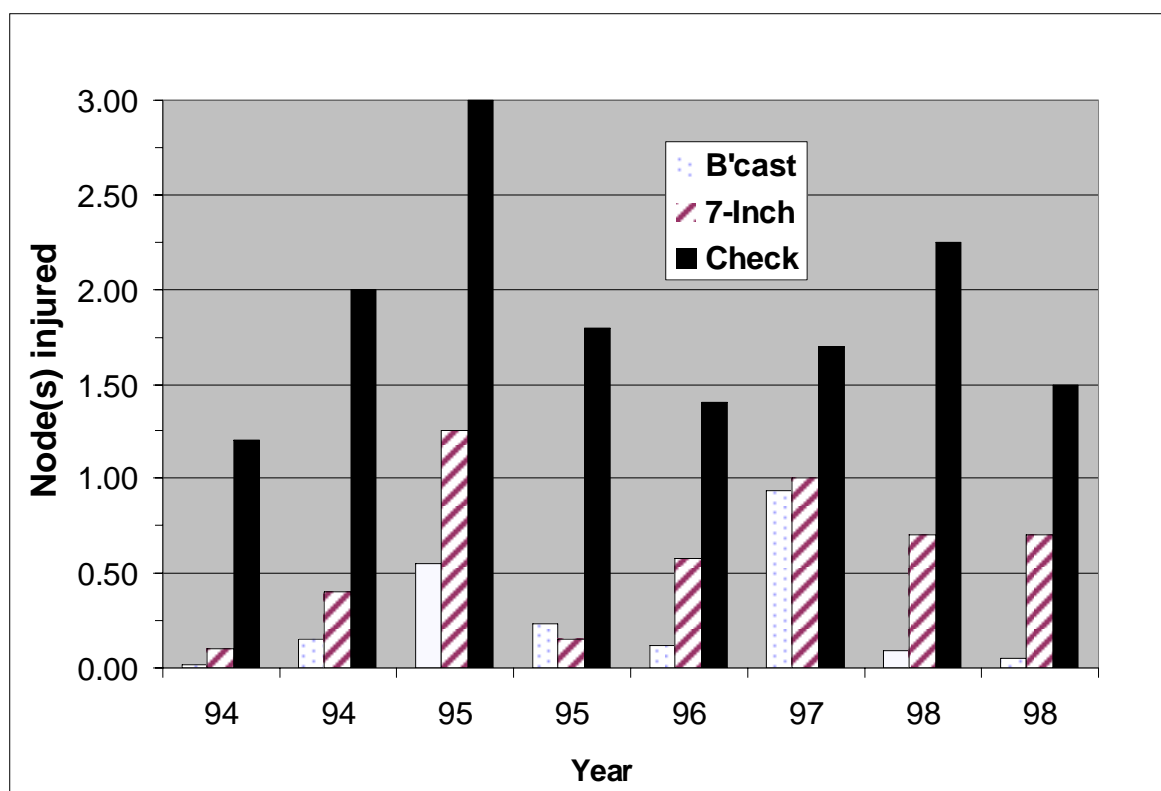


Figure 2. Full (broadcast) and reduced (7"-band) rates of Furadan 4F.